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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,208	11/16/2005	Walter Gumbrecht	0250109	5284

30596 7590 12/02/2010

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EXAMINER	
BHAT, NARAYAN KAMESHWAR	
ART UNIT	PAPER NUMBER
1634	

NOTIFICATION DATE	DELIVERY MODE
12/02/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/540,208	GUMBRECHT ET AL.	
	Examiner	Art Unit	
	NARAYAN K. BHAT	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-8,10-15 and 21-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 5-8, 10-15 and 21-25,* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 5, 2010 has been entered.

Claim Status

2. Claims 1, 5-8, 10-15 and 21-25 are pending in this application. Applicant has added new claims 21-25. Applicant's arguments filed on February 5, 2010 have been fully considered and are addressed following claim rejections.

The previous rejection of claims 1, 5-6, 8 and 10-15 rejected under 35 USC 103 (a) as being unpatentable over Albers et al in view of Johnson et al in the office action dated November 5, 2009 has been maintained. The previous rejection of claims 1 and 7 rejected under 35 USC 103 (a) as being unpatentable over Albers et al in view of Johnson et al and further in view of Valint et al in the office action dated November 5, 2009 has been maintained. Claims 1, 5-8, 10-15 and 21-25 are under prosecution.

Double Patenting

3. The previous ODP rejection of instant claims 1, 5-8 and 10-15 over claims 1-18 of US Patent 7,527,624 in view of Johnson et al and Valint et al in the office action dated November 5, 2009 has been withdrawn in view of filing of a terminal disclaimer and the approval of the terminal disclaimer by the office on February 4, 2010.

The previous ODP rejection of instant claims 1, 5-8 and 10-15 over claims 11-15 and 19 of copending application 10/539,437 (now US patent 7,642,053) in view of Albers et al, Johnson et al and Valint et al in the office action dated November 5, 2009 has been withdrawn in view of cancellation of claims 11-15 and 19 of copending application 10/539,437.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 5-6, 8, 10-15, 21 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Albers et al (USPN 7,208,077 issued Apr. 24, 2007 and WO 00/62048, published Oct. 19, 2000) in view of Johnson et al (USPN 6,372,813 issued Apr. 16, 2002). USPN '077 is deemed a translation because of the 371 status.

The DNA chip of claim 1 recites the following structural components: a) a flat carrier, b) a hydrophilic reaction layer including a crosslinking agent, c) a microelectrode arrangement partially embedded in a hydrophilic reaction layer for detecting binding events and d) an array of spots containing catcher molecules distributed three dimensionally.

Regarding structural component 'a', Albers et al teaches a DNA chip comprising a flat carrier 1 (Fig. 1a, column 5, lines 37-38).

Regarding structural component 'b', Albers et al teaches a hydrogel layer (column 16, lines 15-18), which is a hydrophilic reaction layer as recited in the instant claim. Albers et al do not teach that the hydrogel includes a crosslinking agent.

Regarding structural component 'c', Albers et al teaches a microelectrode arrangement 3a and 3a' in an array position 4 (Fig. 1a, column 9, lines 18-20) for detecting binding events between an affinity binding molecule (i.e., a catcher molecule) and a target molecule (Abstract, column 16, lines 14-22). Albers et al also teaches that

the microelectrodes are embedded in the hydrogel layer (i.e., hydrophilic reaction layer; column 16, lines 14-18).

Regarding structural component 'd', Albers et al teaches an affinity binding molecule (i.e., a catcher molecule) is incorporated into the hydrogel layer covering the microelectrode and further teaches that the microelectrodes 3a are arranged in an array format (Fig. 1d, column 16, lines 5-8), which encompasses array of spots containing catcher molecules and each spot being assigned to a microelectrode arrangement. Albers et al also teaches that the catcher molecules incorporated in the hydrogel are permeable to both the targets and the reagents (column 15, lines 21-27 and column 16, lines 5-8), which encompasses that the immobilized catcher molecules are distributed three-dimensionally.

Albers et al also teaches that the electrode has a width of 1 micrometer and the spacing of 0.9 micrometer (column 26, lines 35-37) and covered with the hydrogel (column 16, line 18). Albers et al do not teach the hydrophilic reaction layer of thickness between 2 um to 10 um.

Regarding claim 5, Albers et al teaches an interdigital electrode arrangement comprising two annular ultra microelectrodes 3a and 3a' (Fig. 1c) and a connecting path 6 (Fig. 1c) on a flat carrier 1s (Fig. 1c). Albers et al also teaches a potentiostat 34 (Fig. 6) and microcontroller/PC (Fig. 6), thus teaching the interdigital electrode arrangement and a system. The teachings of microelectrodes, the connecting path, the potentiostat and the microcontroller of Albers et al encompass a system because the "system" is interpreted to encompass any collection of parts used together.

The instant specification recites a two-pole electrode arrangement as two electrodes on a flat carrier forming an interdigital structure connected to one another by a connecting conductor (i.e., a connecting path; USPGPUB, paragraph 0025). The interdigital electrode arrangement system of Albers et al encompasses the two-pole system of the instant claim as recited in the instant specification. Albers et al do not teach that the hydrophilic reaction layer has a thickness of approximately 3 um.

Regarding claim 6, Albers et al teaches an interdigital electrode arrangement comprising two ultra microelectrodes 3 and 3' (Fig. 2c) and pair of auxiliary electrodes 3b and 3c (Fig. 2a, column 8, lines 35-65), and the potentiostat 34 (Fig. 6) and the microcontroller/PC (Fig. 6), thus teaching the interdigital electrode arrangement and the system. Albers et al also teaches that the ultra microelectrodes are sensor electrodes (column 5, lines 15-25) and auxiliary electrodes are voltage electrodes (column 23, lines 30-31). The instant specification recites a four-pole electrode arrangement as two current electrodes and two voltage electrodes (paragraph 0037). The interdigital electrode arrangement system comprising sensor and voltage electrodes of Albers et al encompasses a four-pole system of the instant claim as recited in the instant specification. Albers et al do not teach that the reaction layer has a thickness of approximately 7 um.

Regarding claim 8, Albers et al teaches that the catcher molecules (i.e., the affinity molecules) are incorporated into the gel (column 16, line 5). Albers et al do not teach that the hydrophilic reaction layer contains coupling groups for the covalent binding of catcher molecules.

Regarding claim 10, Albers et al teaches a hydrogel layer (i.e., a hydrophilic reaction layer; column 16, lines 15-18). Albers et al do not teach that the hydrogel is an acrylamide based radical crosslinkable hydrogel comprising one of maleic anhydride and glycidyl methacrylate.

Regarding claim 11, Albers et al teaches that the electrode arrangement is an interdigital electrode arrangement (Fig. 1, column 7, lines 39-41).

Regarding claim 12, Albers et al teaches an interdigital electrode arrangement comprising two annular ultra microelectrodes 3a and 3a' (Fig. 1c) and a connecting path 6 (Fig. 1c) on a flat carrier 1s (Fig. 1c). Albers et al also teaches a potentiostat 34 (Fig. 6) and microcontroller/PC (Fig. 6), thus teaching the interdigital electrode arrangement and a system. The teachings of microelectrodes, the connecting path, the potentiostat and the microcontroller of Albers et al encompass a system because the "system" is interpreted to encompass any collection of parts used together.

The instant specification recites a two-pole electrode arrangement as two electrodes on a flat carrier forming an interdigital structure connected to one another by a connecting conductor (i.e., a connecting path; USPGPUB, paragraph 0025). The interdigital electrode arrangement system of Albers et al encompasses the two-pole system of the instant claim as recited in the instant specification.

Regarding claim 13, Albers et al teaches an interdigital electrode arrangement comprising two ultra microelectrodes 3 and 3' (Fig. 2c) and pair of auxiliary electrodes 3b and 3c (Fig. 2a, column 8, lines 35-65), and the potentiostat 34 (Fig. 6) and the microcontroller/PC (Fig. 6), thus teaching the interdigital electrode arrangement and the

system. Albers et al also teaches that the ultra microelectrodes are sensor electrodes (column 5, lines 15-25) and auxiliary electrodes are voltage electrodes (column 23, lines 30-31). The instant specification recites a four-pole electrode arrangement as two current electrodes and two voltage electrodes (paragraph 0037). The interdigital electrode arrangement system comprising sensor and voltage electrodes of Albers et al encompasses a four-pole system of the instant claim as recited in the instant specification.

Regarding claim 14, Albers et al teaches a DNA chip that includes a planar substrate, i.e., flat carrier 1(Fig. 1a, column 5, line 37), which includes a silicon substrate (i.e., a semiconductor layer 1s; Fig. 1d, column 9, lines 30-31) and an insulating layer 7 connected thereto (Fig. 1d, column 9, line 30) and the insulating layer carrying the electrode arrangement 3a and 3a' (Fig. 1d). Albers et al also teaches that the catcher molecules (i.e., the affinity molecules) are incorporated in to the hydrogel layer in the volume compartment of the electrode 3a and 3a' (Fig. 1d, column 15, lines 21-27 and column 16, lines 5-8). Albers et al also teaches that an insulating layer 7 is between the electrode and the semiconductor layer 1s (Fig. 1d, column 10, line 33), thus teaching the hydrogel layer (i.e., the hydrophilic reaction layer) is remote form the semiconductor layer.

Regarding claim 15, Albers et al teaches that the semiconductor layer is a silicon layer 1s (Fig. 1d, column 9, lines 30-31).

Regarding claim 21, Albers et al do not teach that the crosslinking agent is methylene bisacrylamide.

Regarding claim 24, Albers et al do not teach that the hydrophilic reaction layer (i.e., the hydrogel layer) is thermally cross-linked by the crosslinking agent.

Regarding claim 25, Albers et al do not teach that the hydrophilic reaction layer (i.e., the hydrogel layer) is photo-crosslinked by the cross linking agent.

As described above, regarding claims 1, 5-6 and 21, Albers et al do not teach the hydrogel layer (i.e., the hydrophilic reaction layer) thickness and the hydrophilic reaction layer includes a crosslinking agent.

Regarding claim 8, Albers et al do not teach the hydrophilic reaction layer containing coupling groups for the covalent binding of catcher molecules.

Regarding claim 10, Albers et al do not teach the hydrogel layer (i.e., the hydrophilic reaction layer) is an acrylamide based hydrogel including one of maleic anhydride or glycidyl methacrylate.

Regarding claims 24 and 25, Albers et al do not teach that the hydrophilic reaction layer is thermally crosslinked or photo-crosslinked with a crosslinking agent.

However, the reaction layer composition, coupling groups for covalent binding of catcher molecules and the reaction layer thickness were known in the art at the time the claimed invention was made as taught by Johnson et al.

Johnson et al teaches a biochip comprising a polymer hydrogel arrays, wherein thickness of the hydrogel layer (i.e., reaction layer) is between about 1um to about 40 um or preferably between about 3 and 30 um and optimally about 5 um (column 5, lines 31-37). The 5 um thickness of the hydrogel layer (i.e., the hydrophilic reaction layer)

encompasses the thickness between 2 um to 10 um or thickness of approximately 3 um or 7 um as claimed (limitations of claims 1, 5 and 6).

Johnson et al also teaches that the acrylamide based radical cross-linkable hydrogel includes glycidyl methacrylate (column 13, lines 23-26, limitations of claim 10) and crosslinking agent includes methylene bisacrylamide (column 1, lines 40-46, limitation of claim 21). Johnson et al further teaches that the hydrogel includes a cross linking agent (column 10, lines 15-23 and column 13, lines 64-67, limitation of claim 1). Johnson et al also teaches that the hydrophilic reaction layer comprises either maleimide (Fig. 3, column 3, lines 53-57) or acrylate (Fig. 4, column 3, lines 58-61) coupling groups for the covalent binding of DNA molecules (i.e., catcher molecules, column 16, lines 59-65, limitations of claim 8). Johnson et al also teaches that the hydrophilic reaction layer is thermally crosslinked (i.e., by elevated temperature) or photo-crosslinked with a crosslinking agent (column 1, lines 35-54, limitations of claims 24 and 25). It is also noted that thermal crosslinking and photo-crosslinking of acrylamide based hydrogels are routinely practiced in the art and is obvious over Johnson et al.

Johnson et al also teaches that the hydrogel pads are easy to produce, economical, reduces the biochip manufacturing cost, enhances the throughput and cross-linking of the hydrogel and attachment of biomolecules are done in a single step (column 3, lines 19-25 and 37-44).

Both Albers et al and Johnson et al teach a biochip comprising a hydrogel layer. Johnson et al teaches the detailed composition of the claimed hydrophilic reaction layer

and further teaches cross-linking of the hydrogel and attachment of biomolecules are done in a single step, there by reducing the cost of manufacturing of a biochip, thus providing motivation to one of ordinary skill in the art to modify the hydrogel of Albers et al for producing a biochip in a single step.

It would have been prima facie obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the hydrogel layer of Albers et al with the hydrogel layer of varying thickness of Johnson et al with a reasonable expectation of success.

An artisan would have been motivated to modify the hydrogel layer of Albers et al with the expected benefit of having a hydrogel pads that are easy to produce, economical, which reduces the biochip manufacturing cost, enhances the throughput and performing cross-linking of the hydrogel and attachment of biomolecules in a single step as taught by Johnson et al (column 3, lines 19-25 and 37-44).

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Albers et al (WO 00/62048, published Oct. 19, 2000) in view of Johnson et al (USPN 6,372,813 issued Apr. 16, 2002) as applied to claim 1 as above and further in view of Valint et al (USPG PUB 2002/0102415 published Aug. 1, 2002).

Claim 7 is dependent from claim 1. The teachings of Albers et al and Johnson et al regarding claim 1 are described above in section 6.

Regarding claim 7, Albers et al teaches that biochip comprising hydrogel is used at 40^0 C (column 30, lines 65-67). Albers et al and Johnson et al do not teach thermal

stability of a hydrogel. However, thermal stability of the hydrogel was known in the art at the time the claimed invention was made as taught by Valint et al.

Valint et al teaches a hydrogel polymer layer on the electrode surface and further teaches that the hydrogel polymer layer is resistant to heat up to 90^0 C (paragraphs 0147, 0148, 206 and 0217), which encompasses reaction layer thermally stable up to approximately 95^0 C. Valint et al further teaches that hydrogel having thermal stability is sterilized easily without changes in its property (paragraph 0152, Table 13).

It would have been prima facie obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the hydrogel of Albers et al with the thermally stable hydrogel of Valint et al with a reasonable expectation of success.

An artisan would have been motivated to modify the hydrogel of Albers et al and Johnson et al with the expected benefit of sterilizing hydrogel and still retaining its property as taught by Valint et al (paragraph 0152).

8. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Albers et al (USPN 7,208,077 issued Apr. 24, 2007 and WO 00/62048, published Oct. 19, 2000) in view of Johnson et al (USPN 6,372,813 issued Apr. 16, 2002) as applied to claim 1 as above and further in view of Mansouri et al (USPGPUB 2003/0000833, published Jan. 2, 2003). USPN '077 is deemed a translation because of the 371 status. The dimthacrylate is same as dimethylacrylate as applied for the rejection of claims 22 and 23 is further evidenced by Datasheet dimethyl acrylic acid

[chemical register.com]. Retrieved from the Internet:

URL:http://chemicalregister.com/3_3-Dimethylacrylic_acid/suppliers/pid28139.htm.

Claim 23 is dependent from claim 22, which is dependent from claim 1. The teachings of Albers et al and Johnson et al regarding claim 1 are described above in section 6.

Regarding claims 22 and 23, Albers et al and Johnson et al do not teach cross linking agent is tetraethylene glycol dimethylacrylate. However, tetraethylene glycol dimethylacrylate cross linking agent was known in the art at the time the claimed invention was made as taught by Mansouri et al.

Mansouri et al teaches a biosensor (i.e., a biochip) comprising a glass disk with the embedded platinum wires (i.e., electrodes; paragraph 0140) and further teaches that the platinum wires (i.e., platinum electrodes) are embedded in the membranes (paragraph 0141). Mansouri et al also teaches that the membrane comprises a hydrogel wherein the crosslinking agent is tetraethylene glycol dimethacrylate (paragraph 0141), thus teaching that the crosslinking agent is a dimethylacrylate (limitation of claim 22) and the dimethylacrylate is a tetraethylene glycol dimethacrylate (limitation of claim 23). The dimethacrylate is a synonym of dimethylacrylate as further evidenced by Datasheet dimethyl acrylic acid [chemical register.com; pg.1].

Mansouri et al also teaches that the tetraethylene glycol dimethacrylate hydrogel polymer has the advantage of not peeling away from the surface of the electrode when membrane hydrates (paragraph 0142), thus protecting the electrodes even after hydration.

As described above, Albers et al, Johnson et al and Mansouri et al teach a biochip/biosensor. Albers et al and Mansouri et al teaches that the hydrogel layer is on the electrode surface and Mansouri et al teaches that the hydrogel comprising the tetraethylene glycol dimethacrylate crosslinking agent provides a stable hydrogel and protects the electrode after hydration, thus providing motivation to one of ordinary skill in the art to modify the hydrogel of Albers et al for having enhanced mechanical strength (i.e., not peeling off from the surface).

It would have been prima facie obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the hydrogel of Albers et al with the hydrogel having tetraethylene glycol dimethacrylate crosslinking agent of Mansouri et al with a reasonable expectation of success.

An artisan would have been motivated to modify the hydrogel of Albers et al and Johnson et al with the expected benefit of having stable hydrogel for protecting the electrode even after hydration as taught by Mansouri et al (paragraph 0142), thus providing a stable hydrophilic reaction layer for DNA chip of Albers et al.

Response to Remarks from the Applicants

Claim Rejections under 35 U.S.C. § 103(a)

9. Applicant's arguments filed on February 5, 2010 have been fully considered (Remarks, pgs. 6-8). Applicant has not provided any new arguments. Instead, Applicant summarized the interview summary between the Examiner and the representative Ms.

Wilson. The assertions made by the representative during the interview on January 6, 2010 are acknowledged by the Examiner.

It is also noted that Applicant has only presented arguments of counsel that have not been supported by evidence (Remarks, pg. 6, paragraph 5). MPEP 716.01(c) makes clear that "The arguments of counsel cannot take the place of evidence in the record. In re Schulze , 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). Examples of attorney statements which are not evidence and which must be supported by an appropriate affidavit or declaration include statements regarding unexpected results, commercial success, solution of a long - felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant." Here, the statements regarding the unexpected results of observation of electrochemical sensitivity characteristics of a DNA chip having the hydrogel thickness and the electrode arrangement must be supported by evidence, not by argument.

The examiner also emphasized during the interview that Albers et al teaches the microelectrode arrangement embedded in the hydrogel layer and teachings of Johnson et al are relied only for details of the hydrogel composition and not for the electrode. The Examiner also emphasized that the art is very rich on the hydrogel composition and embedding the electrodes in the hydrogel is routinely practiced in the art (e.g., see Albers et al, Mansouri et al) and therefore would not be novel over Albers et al in view of Johnson et al.

Applicant's representative asserts that the crosslinking agent of Johnson et al assists the reactive site with attachment of biomolecules rather than being used to form an internally crosslinked hydrogel (Remarks, pg. 7, paragraph 1). The assertion made by the Applicant's representative is acknowledged by the Examiner. However, as described above in section 6, Johnson et al teaches hydrophilic reaction layer is an acrylamide-based radical-crosslinkable hydrogel including at least one of maleic anhydride and glycidyl (meth)acrylate as coupling groups (column 13, lines 23-26). Furthermore, instant claim 8 as recited require the hydrophilic reaction layer contain coupling groups for covalent binding of capture molecules, which Johnson et al teaches (Fig. 3, column 3, lines 53-57, Fig. 4, column 3, lines 58-61). Also the open claim language "comprising" can include other functions for the claimed cross-linking agent beside the one for internally crosslinking the hydrogel.

As discussed above in sections, 6-8, the claimed biochip is obvious over the cited reference and also because claimed electrode arrangement and the hydrophilic reaction layer are routinely practiced in the art as also taught by Albers et al, Johnson et al, Valint et al and Mansouri et al.

Conclusion

10. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Narayan K. Bhat whose telephone number is (571)-272-5540. The examiner can normally be reached on 8.30 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Nguyen can be reached on (571)-272-0731. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Narayan K. Bhat

Examiner, Art Unit 1634

/Steven C Pohnert/

Primary Examiner, Art Unit 1634